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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,252	02/27/2002	Tadayashi Kawaguchi	500.41295X00	2571

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EXAMINER	
KACKAR, RAM N	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/083,252	KAWAGUCHI ET AL.	
	Examiner	Art Unit	
	Ram N Kackar	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/18/05 & 12/16/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/16/2005 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al (JP 2000-323298-A) in view of Demos et al (US 2001/0008138-A1), Pu et al (20010054383) and Drewery et al (US 6287435).

Doi et al teach an apparatus (Fig. 9) for plasma processing which has a vacuum vessel forming a plasma producing part 2a, a gas supplying source (means) 4 for supplying a gas to the vacuum vessel, an antenna 1a, 1b generating an electric filed in the plasma producing part, a Faraday shield 8a provided at outer periphery of the vacuum vessel, a high-frequency electric source 10 supplying a high-frequency electric power to the antenna and the Faraday shield. The apparatus of Doi et al includes gas source containing boron trichloride and chlorine in etching aluminum and quartz (paragraph 0066) and the voltage applied to the Faraday shield can be adjusted upto 1000 V (paragraph 0047).

Doi et al fail to teach an end point determination and detection device wherein the device detecting the end point of cleaning of the inner wall of the vacuum vessel by detecting emission wavelength of reaction products or a material of the vacuum vessel.

Demos et al teach a plasma processing apparatus including an optical emission detection device for monitoring and detecting an end of the cleaning process of the inner wall of the process chamber (abstract). The end point for plasma cleaning may be determined by optical emission technique wherein the emission from SiF line may be monitored at a predetermined wavelength during removing SiO2 from the interior chamber surface (paragraph 0032).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the detection system as taught by Demos et al in the apparatus of Doi et al in order to monitor and detect the end of cleaning of the interior surface of the chamber.

Doi et al disclose the plasma producing part 2a to be made of silica or ceramic but do not disclose it to be made of alumina.

Pu et al disclose an inductively coupled plasma and disclose a dielectric top lid of alumina to allow electrical power to be coupled through it and teach that alumina is successfully used and is much less expensive than other dielectric materials (Paragraph 35).

Regarding the limitation of transferring a dummy wafer to electrode which supports the wafer, it is noted that structure required to transfer a dummy wafer is no different than the structure to transfer a regular wafer. It is also inherent that there will have to be some means automatic or manual to transfer wafer to the support for processing. However, transfer means are known for plasma processing systems of the type where electromagnetic energy is coupled to plasma through across a dielectric of alumina with faraday shield (Drewery et al – Abstract, Fig 1, Fig 6 and Col 4 lines 63-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use alumina as the material of plasma producing part for its typical use and inexpensive availability and use transfer means to enable processing on the wafer.

Further regarding claim 9: the plasma producing part 2a is made of a dielectric material such as silica or other ceramic. It is noted that when interior surface of the chamber is exposed to the chlorine and boron trichloride, SiCl or other chloride like AlCl would be produced and an emission wavelength of a material of the chamber could be monitored. Furthermore, it is argued that apparatus of Doi et al in view of Demos et al is capable of detecting emission wavelength of a material of the vacuum vessel such SiCl or AlCl. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley,* 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.,* 15USPQ2d

1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed dos not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham,* 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Response to Arguments

Applicant's arguments filed 12/16/2005 have been fully considered but they are not persuasive. Applicants assert that the claimed apparatus includes detecting emission wavelength of reaction products generated when the cleaning gas is boron trichloride and chlorine and the voltage applied to the Faraday shield is at least 500 V.

The Examiner argues that the apparatus of Doi et al includes gas source containing boron trichloride and chlorine in etching aluminum and quartz (paragraph 0066) and the voltage applied to the Faraday shield can be adjusted upto 1000 V (paragraph 0047). Further, the type of the gas and the amount of voltage applied to the Faraday shield are considered process limitations rather than apparatus structural limitation and the apparatus of Doi et al in view of Demos et al is capable of being utilized under the process conditions as recited in the claims.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the

applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation for combining the optical detection device of Demos et al in the plasma etching apparatus of Doi et al is to monitor the end point of cleaning the plasma processing apparatus of Doi et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R AU1763

Ram Kackar